

Claims

1. A humidifying gas induction or supply system comprising a hydrophilic membrane surface.
- 5 2. The humidifying gas induction or supply system according to claim 1, further comprising a water reservoir integrally formed with the hydrophilic membrane surface.
- 10 3. The humidifying gas induction or supply system of claim 2, further comprising a hood arranged to regulate an area of hydrophilic membrane surface exposed to one of the water reservoir and the gas induction system.
- 15 4. An engine comprising a humidifying air induction or supply system having a hydrophilic membrane surface.
5. The engine according to claim 4, further comprising a water reservoir integrally coupled with the hydrophilic membrane surface.
6. The engine according to claim 5, further comprising a hood arranged to regulate an area of hydrophilic membrane surface exposed to one of the water reservoir and the air induction system.
- 20 7. The engine according to claim 4, further comprising an exhaust system providing exhaust gases, and wherein the water reservoir includes a heat exchanging coil coupled selectively to receive the exhaust gases.
8. The engine according to claim 7, further including a temperature sensing element arranged to regulate a flow of exhaust gas through the heat exchanging coil.
- 25 9. A motorized vehicle containing a humidifying air induction or supply system having a hydrophilic membrane surface.
10. The motorized vehicle according to claim 9, further comprising a water reservoir coupled to the hydrophilic membrane surface.

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11. The motorized vehicle according to claim 10, further comprising a hood arranged to regulate an area of hydrophilic membrane surface exposed to one of the water reservoir and the air induction system.
12. The motorized vehicle according to claim 10, further comprising an exhaust system providing exhaust gases, and wherein the water reservoir includes a heat exchanging coil coupled selectively to receive the exhaust gases.
13. The motorized vehicle according to claim 12, further including a temperature sensing element arranged to regulate a flow of exhaust gas through the heat exchanging coil.
- 10 14. The motorized vehicle according to claim 13, further comprising: a fuel tank having a hydrophilic membrane surface across which water vapor pervaporates.
- 15 15. A fuel cell comprising a humidifying gas induction or supply system having a hydrophilic membrane surface.
- 15 16. The fuel cell according to claim 15 further comprising the hydrophilic membrane having at least two faces; the first face being in contact with a hydrogen gas stream and the second face being in contact with wet exhaust air such that water vapor pervaporates across the hydrophilic membrane from the wet exhaust gas into the hydrogen gas stream.
- 20 17. The fuel cell according to claim 16 having at least a second hydrophilic membrane, the second hydrophilic membrane having at least two faces; the first face being in contact with the hydrogen gas stream and the second face being in contact with a container of liquid water, such that water vapor pervaporates across the second hydrophilic membrane from the container of liquid water and into the hydrogen gas stream.
- 25 18. The fuel cell according to claim 16 having at least a third hydrophilic membrane, the third hydrophilic membrane having at least two faces; the first face being in contact with an air or oxygen gas stream and the second face being in

contact with wet exhaust air such that water vapor pervaporates across the third hydrophilic membrane from the wet exhaust gas into the air or oxygen gas stream.

19. The fuel cell according to claim 17 having at least a third hydrophilic membrane, the third hydrophilic membrane having at least two faces; the first face being in contact with an air or oxygen gas stream and the second face being in contact with wet exhaust air such that water vapor pervaporates across the third hydrophilic membrane from the wet exhaust gas into the air or oxygen gas stream.

20. The fuel cell according to claim 18 having at least a fourth hydrophilic membrane, the fourth hydrophilic membrane having at least two faces; the first face being in contact with the air or oxygen gas stream and the second face being in contact with a container of liquid water such that water vapor pervaporates across the fourth hydrophilic membrane from the container of liquid water and into the air or oxygen gas stream.

21. The fuel cell according to claim 19 having at least a fourth hydrophilic membrane, the fourth hydrophilic membrane having at least two faces; the first face being in contact with the air or oxygen gas stream and the second face being in contact with a container of liquid water such that water vapor pervaporates across the fourth hydrophilic membrane from the container of liquid water and into the air or oxygen gas stream.

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